

Tributary Tribune

Service Year 22 District A, 2016 Volume 22, Issue 1

Stories and Art by the Members of the Watershed Stewards Program





Watershed Stewards Program District A Members. From top left to right: David White, John Herrera, Rowyn Cooper– Caroselli, Steven Schade, Lia Nelson, Caitlin Jetter, Wiyaka Previte, Christine Cosby, Amanda Lee, Rachelle Tallman, and Amy Duarte. *Photo Credit: Zia Schatz*.



The Watershed Stewards Program's (WSP) mission is to conserve, restore, and enhance anadromous watersheds for future generations by linking education with high quality scientific practices.

A program of the California Conservation Corps, WSP is one of the most productive programs for future employment in natural resources. WSP is administered by California Volunteers and sponsored by the Corporation for National and Community Service.

ABOUT THE WATERSHED STEWARDS PROGRAM

For the past 22 years, the Watershed Stewards Program (WSP) has been engaged in comprehensive, community-based, watershed restoration and education throughout coastal California. WSP was created in 1994 by California Department of Fish and Wildlife (CDFW) biologists, educators, and the California Conservation Corps to fill critical gaps in scientific data collection, in-stream restoration, and watershed education. In collaboration with landowners, tribal communities, teachers, community members, nonprofit organizations, and government agencies, WSP works to revitalize watersheds that contain endangered and threatened salmonid species (Chinook salmon, Coho salmon, and steelhead trout) by using state-of-the-art data collection and watershed restoration techniques. WSP also engages members in education, outreach, and volunteer recruitment efforts to increase the capacity of partner organizations. WSP currently has Members working from the Oregon border to the Santa Monica Mountains.

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The Tributary Tribune
showcases the adventures,
insights, and art of members of
the Watershed Stewards
Program. For 22 years, WSP has
been serving communities
throughout California's coastal
watersheds. This issue features
stories and art by Members
from District A, which
encompasses WSP sites from
Yreka to Eureka, CA.



WSP Members and staff participating in a field tour at the Salt River Project. Photo credit: Doreen Hansen.

A Reflection on Collaboration

Story & Photos By: Amanda Lee

Placed at US Forest Service, Orleans CA

This year's fall Chinook and winter Coho salmon spawning surveys are progressing despite challenges encountered at USFS Orleans this season. Given the task of surveying hundreds of miles of stream reaches with a reduced number of crew members, we are able to overcome difficulty through collaborative partnerships. We partner with California Department of Fish and Wildlife (CDFW), Mid-Klamath Watershed Council (MKWC), the Karuk Tribe, the Yurok Tribe, and the California Conservation Corps' National Oceanic and Atmospheric Administration Veteran program. These organizations are instrumental in forming long-term data sets that can inform impactful management decisions.

Collaboration takes several forms within our group and often hinges on flexibility and creativity. For our weekly Salmon River dives, we meet with MKWC and CDFW technicians in the beginning of the day to ensure enough people and vehicles are available for the put-in and take-out of four reaches, covering about fifteen miles. At the end of the day we account for each other and assemble the data. This process becomes complex with a shortage of people or vehicles and limited stream access due to dangerous conditions. Our partners help us troubleshoot by finding substitutes to pair up with, strategizing reach coverage, and using boats and other resources to get the work done. Each week, stream reaches throughout the Klamath watershed are divided amongst our partner groups. Our CDFW partners travel between Orleans and Happy Camp to help with our efforts in addition to surveying up river. Some reaches are surveyed by students at Orleans Elementary School, led by former WSP member Carol Earnest of MKWC. Involving students in this endeavor can have cascading effects for the future of watershed health. It connects youth to their environment, which can spark motivation to think and act critically as they grow up, spreading awareness and a sense of stewardship to future generations.

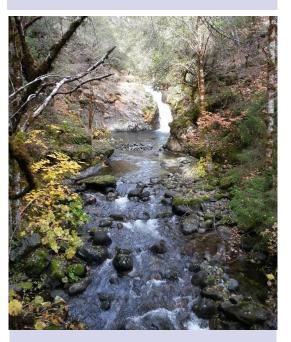
This partnership yields advantages beyond survey coverage. It allows for several eyes over the watershed to spot hazards and changes and fosters the communication of concerns. Working with people from other agencies gives us insight on a broader scale; it presents the opportunity to learn perspectives and experiences and to become informed about other procedures and projects in this field. Having many hands in this effort expands support and consciousness of the fisheries resources in this community. Working collaboratively we can achieve a shared goal of tracking and protecting indispensable salmon runs. We are fortunate to have this partnership.



A tributary entering Camp Creek



A female Chinook salmon on a redd in Camp Creek



A tributary entering Camp Creek

Salmonid Yoga

Photos By: Caitlin Jetter

Placed at California Department of Fish and Wildlife, Yreka CA



A River in Peril

Story & Photos By: Christine Cosby

Placed at Yurok Tribe Environmental Program, Klamath CA

The Klamath River

The Klamath River originates in south-central Oregon and runs 263 miles before reaching the Pacific Ocean in Northern California. It's the second largest river in California per discharge, draining an area of more than 13,000 square miles, and supporting vital species; including native anadromous fishes. What was once one of the most productive salmon producing rivers in the United States is now a river facing a suite of challenges including: drought, dams and diversions, poor water quality, increased temperatures, and scheduled flow regimens that alter the natural cycle of flooding and sediment transport.

Macros Matter

Macroinvertebrates are (simply put) invertebrates that are large enough to be seen with the naked eye! They are notorious for their tolerances or sensitivity to human disturbances and are commonly used as indicators of stream health. For example, Stoneflies, Mayflies, and Caddisflies are all species considered to be sensitive to disturbance; therefore, one would expect to see a decrease in population as disturbance is introduced. Other measures of macroinvertebrates may include evaluating the taxa richness, or total number of distinct species in a sample, the community composition, a measure that looks at the proportion of sensitive taxa in the sample, or the diversity index, which is a measure of diversity within a community. This combination of matrices is used to help determine the level of disturbance within a stream.

Yurok Tribe Environmental Program

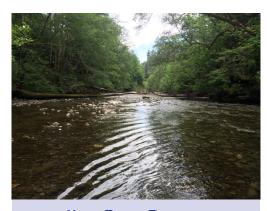
The Klamath River has been central to the life of the Yurok Tribe for thousands of years and they continue to manage it today. The Yurok Tribe Environmental Program (YTEP) was created in 1998 to help "protect and restore tribal habitat, through high quality scientific practices." YTEP's Water Monitoring Division uses the evaluation of benthic macroinvertebrate communities in streams and rivers as one method to assess the physical habitat and biological condition of tributaries to the Klamath River. As the Watershed Stewardship Program members placed at YTEP, we are afforded the opportunity to participate in macroinvertebrates sampling on several tributaries within the lower Klamath basin during the spring and summer months. This experience and contribution to a multi-year dataset assessing the health and vitality of the Klamath River is one of the many reasons I chose the Watershed Stewardship Program.



Steelhead Fry.



Macroinvertebrate transect Tectah Crk.



Upper Turwar Transect.

The Origin of the River People: A Karuk Creation Story

As told by Vera Davis Interpreted By: Wiyaka Previte

Placed at US Forest Service, Eureka CA

The first Spirit People *ikxariyâahiv* from the center of the world netted the salmon. At Ka'tim'îin was a Spirit Man *yurukpathíkreen*. He made the salmon *áama*. He put them in a pool. When they got bigger he put them in the Klamath river *ishkêesh* to go downriver to the ocean *yúras*. When they returned, they were caught by a dip net *taramnîihvar*. They taught us how to fish, that's why we do it this way. The first Spirit People gave us the river and the salmon to survive. That is why we Karuk are called the River People *Káruk va'áraar*.

This is dedicated to the Spirit People who walked before us and to the people who will walk after us.



Ron Reed at Ka'tim'lin (Ishi Pishi Falls) on the Klamath River Somes Bar, CA. Photo courtesy of th Karuk Tribe



Little Ike, the author's
3rd great grandfather,
dip net fishing at
Asánaamkarak (Ike's
Falls) on the Klamath
River Somes Bar, CA.
Photo courtesy of
Humboldt Historical
Society.

Yreka Creek, The Beavers Return!

Story & Photos By: David White

Placed at California Department of Fish and Wildlife, Yreka CA



Mr. Flickinger interprets beaver behavior near a beaver structure in the creek.

My service with the Watershed Stewards Program is filled this fall with Salmonid Surveys on the beautiful, productive rivers of Siskiyou County. We recently surveyed Yreka Creek, the watercourse running through the town of Yreka, the county seat. We were joined on our survey by Don Flickinger from the Yreka office of the United States Forest Service. Mr. Flickinger is involved with the Siskiyou Gardens, Parks and Greenways Association, a group concerned with local river and creek restoration and integrating those concerns with long-term plans for a five mile parkway and trails system centered on the creek. Beavers make a loud noise with their tails, slapping the water when they are alarmed or when they dive into the water.

The Siskiyou Gardens, Parks and Greenways Association is preparing to remove extensive levees erected along the

banks of Yreka Creek nearest the confluence with the Shasta River and extending south to the town of Yreka. These levees are constructed of tailings from gold mining dredging operations in the eighteen-seventies. The restoration will make the

watercourse a better habitat for spawning salmon. On our survey we encountered no less than eight beaver structures. Each of these structures had functional spillways on river left, leaving us to surmise Yreka Creek was the home of left handed beavers. There is evidence of beaver dens, and considerable beaver scat was observed in the clear water. The beavers will return to work, after the recent rains, to repair their previous work in Yreka Creek.

Beavers are highly skilled at building dams moderating stream flows, retaining water in dry spells and providing fish upstream access for spawning. In high water events, the fertility of the stream is spread across nearby bottomland as excess water is dispersed by beaver dams. These bottoms will extend two to three hundred yards further from the immediate banks of the creek when the levees are removed.

Conditions and water levels appear to be supportive of spawning. Sadly, we observed no fish on this reach...Yet. The fishery professionals in our region, both with California Department of Fish and Wildlife and United States Fish and Wildlife, are optimistic the Coho are swimming towards this creek. We expect to find redds and spawning Coho in coming weeks.



Mr. Flickinger tells author's site partner, Caitlin Jetter, all about the beaver's work, highlighting the spillway.

Clarifying a Turbid World: The History and Need for the Salmon Creek Gauging Station

Story & Map By: John Herrera II

Placed at Bureau of Land Management, Arcata, CA

The Headwaters Forest Reserve (hereafter, the "Reserve") is part of the National Conservation Lands and managed by the Bureau of Land Management's (BLM) Arcata Field Office. The primary goals of the Reserve are the conservation of an old growth redwood forest and restoration of forests and rivers degraded by past logging practices. Of the 7,472-acre Reserve, 40% was logged and had roads installed in the past and only 30% is un-harvested, old-growth. The majestic stands of old growth provide critical habitat for threatened species such as the marbled murrelet and northern spotted owl. The South Fork Elk River and Salmon Creek provide habitat for threatened fish species such as coho and Chinook salmon, and steelhead trout. Historic and continued sediment loading from past timber harvest and road construction has reduced habitat availability and quality (Bailey, 2013).

Upon acquisition of the Reserve in 1999, the BLM initiated watershed restoration efforts (Jones & Stokes, 2003). Implementation includes road decommissioning and re-vegetation. Road decommissioning is the process of removing old, eroding roads in order to reduce sediment inputs to streams. To date, 36 of 55 miles (65%) of logging roads have been successfully treated.

To evaluate the effectiveness of restoration efforts, the BLM monitors turbidity in Salmon Creek. Turbidity is a visual assessment of water clarity and sediment loads that is based on the scattering of light by particles suspended in the water column. Essentially, an increase in turbidity is defined as an increase in the concentration of suspended particles. Turbidity is used to estimate the annual quantity of sediment transported. Additionally, elevated turbidity is known to have negative effects on fish growth at every stage of the life cycle. Suspended sediment has the potential to clog fish gills and settle to the stream bed where it can suffocate fish eggs and benthic macro-invertebrates, a major food source of larval fish (EPA, 2012). High turbidity can also cause an increase in water temperature and a decrease in light penetration and photosynthesis which leads to reduced levels of dissolved oxygen (EPA, 2012).

Preliminary data suggest that overall turbidity in the watershed is low and comparison with nearby watersheds shows that levels were consistent with other legacy harvests and low intensity harvested watersheds (Bailey, 2013). Long term monitoring at the gauging station is crucial for estimating annual sediment loads and assessing the effectiveness of watershed restoration activities.

The Salmon Creek stream gage continues to be monitored by BLM staff, the HSU Department of Environmental Resources Engineering interns, and by the BLM Arcata WSP Member. As restoration activities in the Reserve progress, the gauging station will allow the BLM to measure their efforts and paint a better picture of sediment transport in the Salmon Creek watershed. Continued road decommissioning will hopefully begin to reduce sedimentation of salmonid habitat in lower Salmon Creek where it drains into southern Humboldt Bay.

Bailey, K.N. 2013. Characterization of discharge, turbidity and suspended sediment, upper salmon creek watershed, Humboldt County, California. Humboldt State University. Department of Environmental Resources Engineering.

EPA. 2012. Water: Monitoring and Assessment. Section 5.5 Turbidity. . United States Environmental Protection Agency, Washington D.C. Available online at http://water.epa.gov/type/rsl/monitoring/vms55.cfm

Jones and Stokes. 2003. Headwaters Forest Reserve Resource Management Plan/EIS/EIR. Administrative Final. Sacramento, CA. Prepared for USDI Bureau of Land Management and California Department of Fish and Game. Arcata, CA.

0	0.45 0.9 1.8 Miles

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Quality and Quantity: Water Resource Assessment With the Yurok Tribe

Story & Photos By: Rowyn Cooper-Caroselli

Placed at Yurok Tribe Environmental Program, Klamath CA



Site partner Christine Cosby and mentor Matt Hanington calibrating a Sonde instrument.

Serving with the Yurok Tribe Environmental Program (YTEP) is a comprehensive crash course in hydrologic and water quality monitoring. My site partner and I are responsible for measuring discharge and performing maintenance monthly at each of five hydrologic monitoring stations on Lower Klamath River tributaries. We perform flow measurements at low flows by wading them with a top set rod, flow meter cups, and an aqua calc, and at high flows with a cable way or bridge crane. Maintenance includes changing out desiccant, downloading data, changing the position of DTS-12 turbidity and temperature probes in the water column, sighting in stage, and troubleshooting suspicious or nonexistent data output.

We are also responsible for a variety of water quality monitoring tasks. YTEP monitors a variety of water quality parameters in the Lower Klamath Mainstem via real time monitoring with multi-parameter datasondes and samples tested for nutrients, bacteria, and algae. WSP Members placed with the tribe maintain records for chain of custody of the samples we send

to labs for analysis and perform the requisite data management and associated USEPA reporting as well as filtering some samples for in house examination. In summer and fall we visit the real time sites twice a month to perform mainte-



Performing high flow measurements via cable-way with mentors Micah Gibson and Koiya Tuttle.

nance and clean and calibrate the sondes.

This position is an excellent opportunity. We find ourselves in beautiful places performing complex and technical field science. Countless unexpected and puzzling equipment malfunctions require us to think critically and develop/apply creative problem solving techniques, often in adverse weather conditions. All of this work is well contextualized in the mission of the tribe to conserve and protect the natural resources under their charge and the exciting possibility of our efforts aiding in the largest dam removal in history.

Tracing Footsteps

Story & Photos By: Steven Schade

Placed at US Forest Service, Orleans CA

Through soft early morning light, I gaze upslope as a heavy fog bank, moving north across the steep ridge, serves as silent escort while we make our way along the Wooley Creek trail of Klamath National Forest. My booted foot falls and slow, deep breaths fall into a rhythm as the dull resounding roar of the Salmon River makes its way to us from one thousand feet below. Despite the autumn chill, I sweat under the weight of my 60 lb. pack and smile, feeling grateful to know that technically, I'm at work. Our task for the next three days: complete a 28+ mile loop of backpacking and snorkel surveys around and within Wooley Creek.



A small wood bridge along the Wooley Creek trail, en route to Fowler's cabin.

Serving as our temporary basecamp and originally built in 1925 along the banks of Wooley Creek, Fowler's cabin is a traditional one-room wooden structure complete with a large front porch, tin roof, and charmingly temperamental wood stove. For nearly 25 years, Chinook and Coho spawning surveys have been conducted here, and WSP members of the USFS Orleans placement site have been aiding in this effort since 2000. Additionally, members of the Karuk and Yurok tribal fisheries programs have also served as integral partners in this effort. A continuous fisheries management endeavor of this duration is significant for both cultural and ecological reasons. Far removed from roads and federally designated a 'Wild & Scenic' river of the Marble Mountains Wilderness Area, Wooley Creek serves as excellent salmonid habitat and contributes as much as 30% of annual flows for the main stem of the Salmon River1.

A highlighted description of this experience is not complete without mentioning an additional historical centerpiece of the area. While making the trek to Fowler's,

one must pass a nearby structure roughly 4 miles from the trailhead, known as Presidential cabin. During his presidency, Theodore "The Bull Moose" Roosevelt, remembered well as an avid naturalist and outdoorsmen, made frequent visits to this cabin for the ample fly fishing and hunting opportunities that abound there. During his time as America's 26th president, he is also remembered for establishing the U.S. Forest Service, as well as many national parks and monuments.

At trip's end, tired, sore, and rambling along the Wooley Creek trail, heading home after several miles and 47 degree Fahrenheit waters, that knowing smile returns once again. I feel incredibly blessed and inspired to have contributed to this endeavor of fisheries and watershed management, all whilst tracing the footsteps and legacy of one of our greatest presidents and wildlands advocate.

1. LeRoy Cyr, Orleans/Ukonom District Fisheries Biologist, Six Rivers National Forest, personal communication.

12 Days of Surveys (To the Tune of 12 Days of Christmas)

Song By: Rachelle Tallman

Placed at US Forest Service, Eureka CA

On the 12th day of surveys my partner said I see:

12 Spawners Spawning

11 Deceptive Redds

10 Sketchy Trails

9 Fallen Logs

8 Mushy Bear Pies

7 Stealing Steelhead

6 Stinky Carcasses

5 SILVER SALMON!

4 Playful Otters

3 Binging Bears

2 Scraped Knees

And a little ole happy me



A Weir(D) Day in the Life of a WSP Member

Story and Photos By: Lia Nelson

Placed at California Department of Fish and Wildlife, Arcata CA

If we're not surveying miles of beautiful streams in Redwood Creek or Humboldt Bay Watersheds for spawning fish, carcasses, and redds, our California Department of Fish & Wildlife (CDFW) Arcata crew is 'fishing' for Pacific Salmon (Oncorhynchus sp.) at the Humboldt Fish Action Council (HFAC) Freshwater Weir. Of course, we're not actually fishing for listed salmon species (that would be illegal and NOT within the WSP mission statement), but rather trapping, marking, and releasing them as part of one of the longest running monitoring projects on threatened coho salmon (O. kisutch) in California.

The Freshwater Weir, located near the mouth of Freshwater Creek in the Humboldt Bay Watershed, is a crucial part of the Coastal Salmonid Monitoring Plan, a plan to comprehensively examine salmonid abundance. Originally an egg collection station for a hatchery, the weir was built in 1981 by a group of commercial fisherman who could see the need to supplement wild fish due to low catch rates. Recently, coho salmon are the primary focus of data collection at the weir, but Chinook salmon (O. tshawystscha), steelhead trout (O. mykiss), and Pacific lamprey (Entosphenus tridentatus) are also observed.

So, what goes on at the weir? Fish are holding in the pool below the weir attempting to swim upstream to locate their perfect spawning location throughout the 14.5 km of anadromous fish habitat in Freshwater Creek. However, the weir panels transverse the creek and block their path, so fish must locate the single opening in order to continue upstream (it's a trap!). We can tell a fish has entered the trap (pictured at right), either when a fish is seen or heard, or during routine checks every half hour. (Continued on page 11).



CDFW Employees examine the trap for fish at the Freshwater Weir.



The rods during a high flow precipitation event, where the weir is completely submerged by Freshwater Creek, Photo Credit: Garrett Dennis.

Mexika Water Prayer

Interpreted By: Amy Duarte Placed at the WSP Office, Fortuna CA



Atzintli, Chalchihuitlicue, Tlaloc, Ometeotl, Purifica limpia limpia curan curan mi Corazon

> Los regalos de la vida curan curan mi Corazon

Water, She who wears the jade skirt, rain god, Creator, Purify, cleanse cleanse, heal heal my heart. Water medicine

Hey-ana, hei-mei, o -hue

Your rivers, the lagoons, the rain from the skies are the gifts of life Heal heal my heart, Water medicine Hey-ana, hei-nai, -oh

"Chalchihuitlicue" (nahuatl)—She who wears the jade skirt. Aztec goddess of water. Illustration by Miquel Covarrubias.

(Continued from page 10)

The fish is netted out of the trap and carried to the cradle. Their species, sex, and length are determined before beginning what I like to call, 'fish surgery.' 'Fish surgery' involves taking genetic samples from a tail fin clip, collecting scales, inserting an RFID pit tag, and marking the fish with a left operculum (gill plate) punch. The fish are then released upstream of the weir so they can continue their spawning journey. This process usually takes about a minute. Don't worry - the fish are handled as gently as possible to minimize impact.

Our CDFW crew will see many of these weir-processed fish as dead carcasses when we conduct spawning surveys on Freshwater Creek. Carcasses are scanned for inserted RFID pit tags and examined for the left operculum punch, which would signify that the fish had gone through our weir. This recapture data is crucial to the analysis of Pacific Salmon populations.

The data gathered from the Freshwater Weir has already contributed significantly to scientific literature on salmon abundance. Since 2002, we have been able to comprehensively estimate the adult population of Pacific salmon species using a mark and recapture analysis that wouldn't be possible without the Freshwater Weir.



Tools used during "fish surgery."



A coho salmon examined in the cradle.

Alumni Spotlight

Interview By: Amy Duarte (Fortuna WSP)

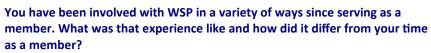
Mitra was a Year 18 Member placed at the Mattole Restoration Council

What was your WSP Member experience like?

My experience in WSP was memorable, fun, challenging, and taught me so much about myself, and working in the habitat restoration field. The experience I had overall was very formative to my life path and career choices.

Was there one experience that was especially memorable? Why?

Tree planting in Oil Creek in the Mattole Watershed was especially memorable to me. It was my first time tree-planting, hiking for miles in a steep, narrow creek canyon with heavy tree bags around my waist full of trees, rain gear, food, water, while carrying my hoedad. Our tree-planting crew was full of unique, off-the-wall individuals who were all really great people. I learned a lot of about restoration, tree planting, and how to use my body for work. The work was hard but rewarding and I will never forget the experience I had those two weeks.





Mitra examining bear tracks near Shelter Cove, CA.

Photo credit: Julia McFarland.

It has been great to continue to be involved with WSP. I enjoy watching others have such formative experiences and create the memories that I once enjoyed myself. It's also great to see so many familiar faces come through the program. Being involved with WSP as an alum is different than my time in the program in that now I can support others while using my own experience to propel my own career forward.

What are your title and responsibilities in your current job? What is involved in a typical day?

My current title is Program Assistant for the Watershed Stewards Program. On a day to day basis, I deal with Member paperwork, gear, general office management, and helping Members with various questions about how to navigate through the sometimes tricky waters of the paperwork world. (Continued on page 12).

What's your favorite part of your job now?

My favorite part of working for WSP is being able to support our Members and all of the great work that they are doing all over California.

How did WSP help prepare you for the work you are currently doing?

Being a Member greatly helped me be prepared to be on staff at WSP because I was already somewhat familiar with the processes we go through to run the program smoothly.

What advice would give current WSP Members?

My advice to current WSP Members is to record the work you are doing to reference in the future, for your resume, future job interviews, personal memory, etc. Also, after your time in WSP, keep moving forward! Use the experience you gain from the program to continue doing similar work (if that is what you want to do) and use the momentum created by being in the program to propel yourself into new experiences! Get creative about where you take your life! The restoration field is ripe with opportunities to expand into things like community organizing, environmental education, outdoor education, botany, and so on! The opportunities are endless.

JOIN THE WATERSHED STEWARDS PROGRAM! APPLICATION REALEASED MAY 1ST, ON OUR WEBSITE.

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Christine Cosby digging a trench for a rain water catchment system. *Photo credit: Blake Batten.*